



## Washington State Parks and Recreation Commission

### Stewardship Brief

Forest Health Series – Kopachuck State Park

June, 2011

The purpose of this document is to provide an overview of known forest health conditions and potential forest treatments within select developed landscapes of Kopachuck State Park. Content is limited to available information<sup>1</sup> and therefore represents a preliminary approach to managing tree-related health and risk in these areas. Development of on-site treatment prescriptions will include additional surveys, analysis, and discussion of tree health and risk issues.

Issue	The primary issue relates to native tree pathogens, which are aggressively attacking trees in select developed landscapes and surrounding natural forests, greatly elevating the risk of tree failure and potential injury to persons and property in and adjacent to these areas (risk = target + tree failure). This is occurring due to the advancing age of the trees, competition, human induced impacts, droughty soils, wind events, and the presence of native tree pathogens. A secondary issue is the age and form of hardwood trees in day-use areas. Many of these trees are old and declining in health.
Location	Across park landscape, especially in / around campground, office, residence, and along the park-urban interface (Fig 1).
Size	80-90 acres of forest; approximately 60 acres addressed in this brief.
Forest vegetation	Forest type: <ul style="list-style-type: none"> <li>j Mature - old growth, mixed conifer forest dominated by Douglas-fir with western red cedar and a salal – sword fern understory (globally &amp; state imperiled [G2/S2]; Fig 2)<sup>2</sup>.</li> <li>j Maturing hardwood forests dominated by big leaf maple and red alder with sword fern understory (some associations imperiled).</li> </ul>
Tree pathogens	<ul style="list-style-type: none"> <li>j Native, active pathogen laminated root rot<sup>3</sup> (<i>Phellinus weirii</i>), with the potential to cause asymptomatic trees to fail without warning, is attacking firs throughout park (especially campground, office / housing area, and along park-private interface).</li> <li>j Other tree pathogens, including two root and butt rots (<i>Phaeolus schweinitzii</i>, <i>Heterobasidion annosum</i>) and a stem rot (<i>Phellinus pini</i>) occur in the park; however, they appear to be far less common than laminated root rot.</li> </ul>
Other natural, cultural, historical attributes	General characteristics: <ul style="list-style-type: none"> <li>j Heronry in park (WDFW priority habitats<sup>4</sup>).</li> <li>j No known historic or cultural resources of significance in the sites discussed in this brief<sup>5</sup>.</li> </ul>

<sup>1</sup> Sources include one survey day with Dan Omdal, DNR State Forest Pathologist and his assistant; 1.5 survey days by the Chief of Resource Stewardship (March-April 2011); observations noted by the west-side Arbor Crews (March 2011 and past work); and conversations with select staff including the Park Manager and Region Steward.

<sup>2</sup> URS Corp. 2009. Kopachuck State Park Vegetation Survey Report. Misc. report to the Washington State Parks and Recreation Commission. 43 p.

<sup>3</sup> Allen, E.A., D.J. Morrison, and G.W. Wallis. 1996. Common Tree Diseases of British Columbia. Natural Resources Canada – Canadian Forest Service, Vancouver. 178 p.

<sup>4</sup> Washington Department of Fish and Game (WDFW) Priority Habitats and Species GIS database. 2011.

<sup>5</sup> Agency Archeological and Historic Preservation staff, personal communication.

<p>Near-term management actions<sup>6</sup></p>	<ul style="list-style-type: none"> <li>j Campground (41 sites, Fig 3-4). <ul style="list-style-type: none"> <li>) Closure of all sites, owing to presence of laminated root rot and other tree pathogens to protect persons and property (Fig 1, large yellow polygon with fine stripes surrounding circular campground loop). Assess level of infestation in adjacent areas (Fig 1, yellow non-striped polygons).</li> </ul> </li> <li>j Park office and staff housing (directly S of campground). <ul style="list-style-type: none"> <li>) Remove most / all Douglas-fir in close proximity (250 ft) to structures and associated developed landscape (Fig 1, large yellow polygon with bold stripes). Remove downed logs.</li> </ul> </li> <li>j Day-use areas <ul style="list-style-type: none"> <li>) Remove laminated root rot infected Douglas-fir adjacent to day-use parking area (Fig 1, small yellow polygon with bold stripes; Fig 5). Assess level of infestation in adjacent areas (Fig 1, yellow non-striped polygons).</li> <li>) Remove select decadent, multi-stem hardwoods near Sound that are in close proximity (150 ft) to picnic tables, interpretive signs, and facilities.</li> </ul> </li> <li>j Park boundaries <ul style="list-style-type: none"> <li>) Assess condition of trees along park interface with private residences and schools to identify presence and extent of tree pathogens (Fig 1, yellow shaded areas with fine stripes along park boundary).</li> </ul> </li> </ul>
<p>Potential management options / considerations<sup>6</sup></p>	<ul style="list-style-type: none"> <li>j Campground <ul style="list-style-type: none"> <li>) Determine future of campsites. Permanently close sites <u>or</u> mitigate root rot issues by removing all Douglas-fir / grand fir from majority of campground (a few sites in the N-NW corner of the campground may be laminated root rot-free at this time and might be retained; Fig 6). In the event of the latter, replant with red cedar and encourage hardwoods, western hemlock (limited number), and shrubs.</li> <li>) All / majority of cut Douglas-fir should be removed to limit risk of Douglas-fir beetle infestation (<i>Dendroctonus pseudotsugae</i>).</li> <li>) Annually, old-growth and residual Douglas-fir trees in this campground should be assessed for presence of pathogens and structural integrity.</li> </ul> </li> <li>j Park office and staff housing <ul style="list-style-type: none"> <li>) Replant disturbed area with western red cedar and other species known to be tolerant of laminated root rot. Monitor tree health.</li> </ul> </li> <li>j Day-use areas <ul style="list-style-type: none"> <li>) Replant in large gaps with western red cedar, hardwoods, and other species known to be tolerant of laminated root rot. Monitor tree health.</li> </ul> </li> <li>j Park boundaries <ul style="list-style-type: none"> <li>) Replant in large gaps with western red cedar, hardwoods, and other species known to be tolerant of laminated root rot. Monitor tree health.</li> </ul> </li> </ul>
<p>Comments</p>	<ul style="list-style-type: none"> <li>j If we do nothing, the laminated root rot will continue to expand in area and will kill those Douglas-fir and grand fir trees that it encounters. Trees may exhibit signs of pathogen (thinning crown, dead tops, tipping); however, trees can fail at the roots when tree is asymptomatic. In time, a very limited number of Douglas-fir trees may escape the pathogen (where infected trees nearby are uprooted, thereby slowing the spread of the pathogen), with the majority of the park landscape moving towards an early successional hardwood-shrub community supporting select cedars and hemlocks in the mix (Fig 7).</li> <li>j Douglas-fir and grand fir regeneration should not be encouraged in areas supporting laminated root rot.</li> </ul>

<sup>6</sup> Management recommendations are proposed by the Chief of Resource Stewardship with input from DNR State Forest Pathologist, Park Manager, Region Operations Manager, Region Steward, Region Director and Agency Risk Manager.

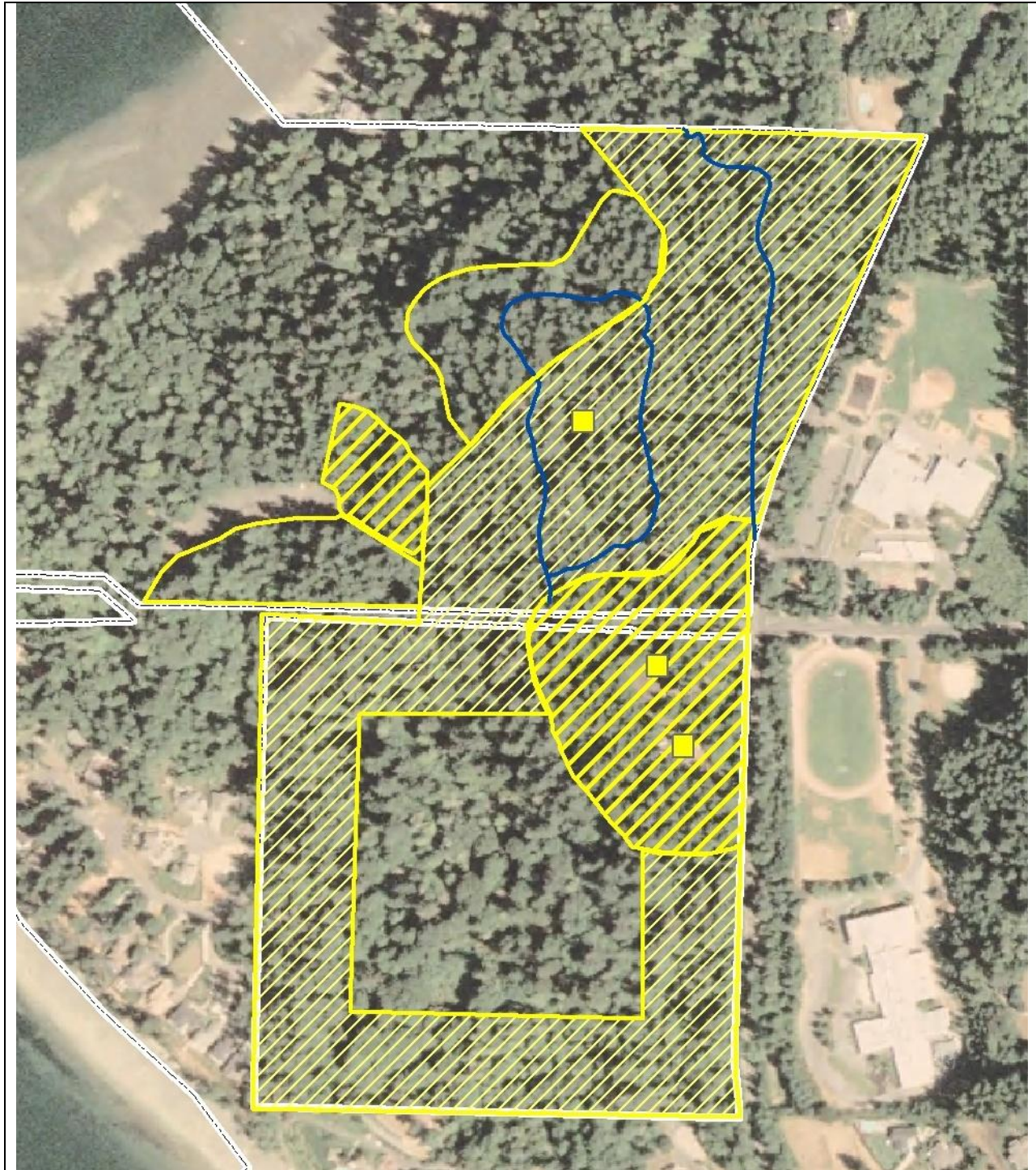


Figure 1. Park areas with elevated risk to persons and property owing to presence or potential presence of laminated root rot. Park boundary is white, yellow squares represent structures, and select in-park roads are blue. See text for further discussion of shaded areas.





Figure 2. Mature – old growth, mixed conifer forest dominated by Douglas-fir that is common throughout much of the park.



Figure 3-4. Kopachuck campground dominated by 100 year-old Douglas-fir, with select old-growth Douglas-fir stems and shrub understory.



Figure 5. Laminated root rot pocket at E end of day-use parking area.



Figure 6. N-NW corner of campground that does not appear to have laminated root rot at this time.



Figure 7. Laminated root rot is likely to convert current Douglas-fir forest to hardwood and shrub dominated community.

